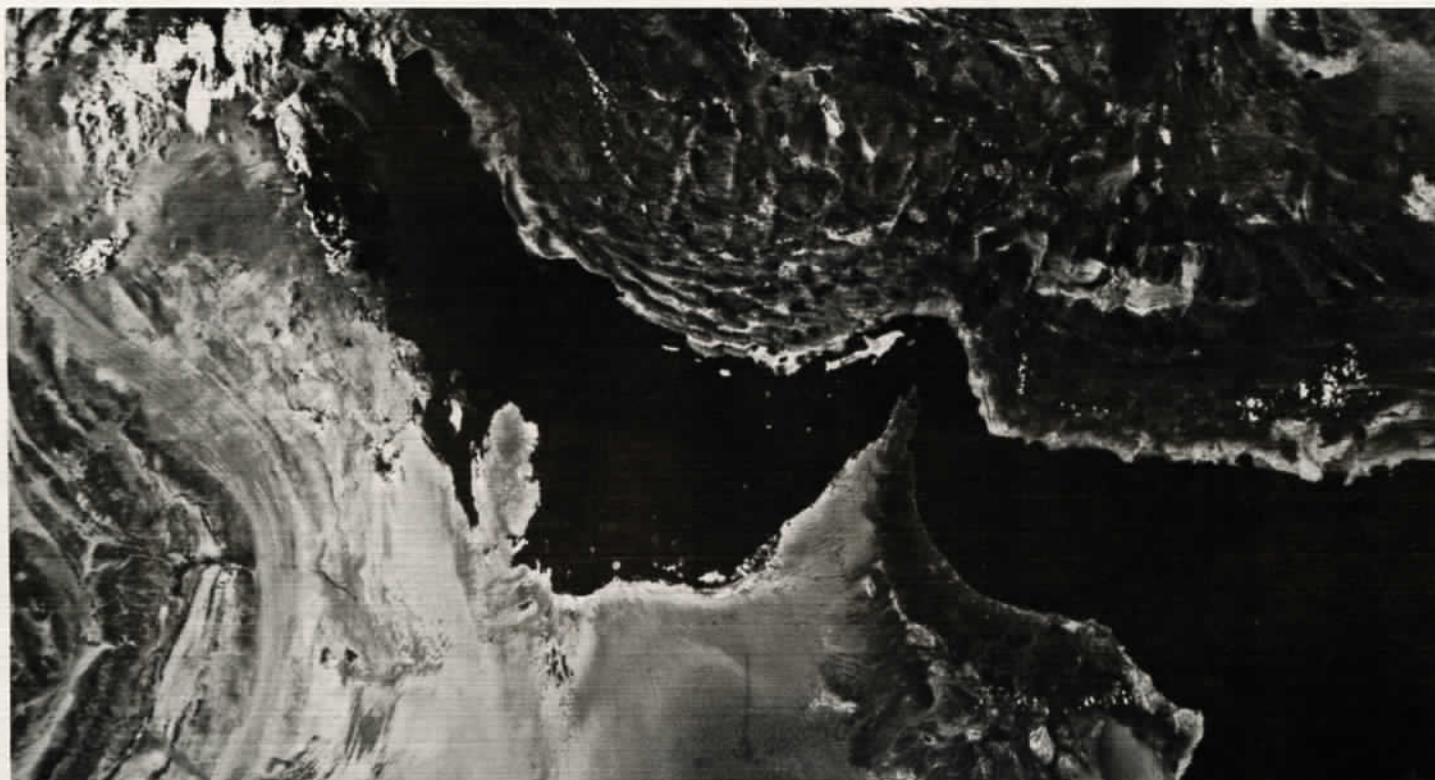


The Center Scene

FALL 1987



Acquired by a meteorologic satellite that circles the Earth 517.6 miles above its surface, this image covers the entire Persian Gulf and Kuwait on the west; parts of Saudi Arabia on the west and south; the United Arab Emirates and part of Oman on the south; and parts of Iran and Pakistan on the northeast. Qatar projects into the Gulf from the south. Qeshm Island is in the Straits of Hormuz where the Persian Gulf narrows between Iran and United Arab Emirates. The Gulf of Oman is on the southeast. The photo, which was processed at EROS, appeared on a national network news special.

AVHRR Image on National TV

A satellite image processed at the EROS Data Center served as a backdrop for an ABC News Special, the Jennings-Koppel Report, "Questions of Policy, Questions of War," on activities in the Persian Gulf, aired on July 7, 1987.

The panoramic image was acquired from the National Oceanic and Atmospheric Administration (NOAA), and processed on EDC's Advanced Very High Resolution Radiometer (AVHRR) Data Acquisition and Processing System. The AVHRR picture, a NOAA meteorological satellite image, was used repeatedly in the broadcast. Landsat and SPOT data, provided by EOSAT and SPOT Image, were also used.

An article called "Remote possibilities for remote sensing" in the July 20, 1987, Broadcasting magazine described it this way. "The pictures showed the gulf both from a high-flying government weather satellite [the AVHRR image] and a lower-level, remote-sensing Landsat satellite, as well as three-dimensional pictures from yet another satellite, the French SPOT, of the sites on Qeshm Island in the Straits of Hormuz, where the U.S. says Iran may install Silkworm missiles to threaten shipping in the gulf. The pictures grabbed and held the viewer's attention. Computer-enhanced, remote sensing imaging—as the technique is called—is, said Jeff Gralnick, execu-

tive producer in charge of ABC news specials, 'a damned interesting reporting tool.'"

Mark Brender, ABC News assignment editor in Washington and chairman of the RTNDA Media in Space Committee, visited EDC in May when he was on the Pecora XI program. Brender's efforts to persuade the American media that remote sensing should be a journalistic tool was the topic of his Pecora presentation. The use of the AVHRR image on the national network special was primarily made possible through Brender's interest and the efforts of the EDC staff to acquire and process the data within a very brief time span. It was shown again on a September 4 MacNeil/Lehrer feature on media use of remote-sensing technology.



UP FRONT US WEST STAFF VISIT

Once again, you "did us proud!" That old saying best expresses my feelings about the perfor-

mance and appearance of EDC employees during the visit of the US WEST Advanced Technologies Laboratory site selection team.

EROS was honored to be selected as the example of a successful, professional high technology research and production facility in South Dakota for the State's campaign to acquire the prestigious Advanced Technologies Laboratory. EROS has brought unique dividends to South Dakota, including international recognition of scientific research activities and accomplishments.

Like EROS, the US WEST laboratory will be a significant addition to the scientific and educational community of the state that becomes its site.

Our task was to impress upon the site selection team that top-level, world-class scientists and engineers from noted universities, private industry, and the government, from metropolitan areas across the country, can be recruited and retained in South Dakota when challenging opportunities are available at an eminent research facility with a national and international reputation. And this we did.

We also had the opportunity to impress upon the US WEST staff, the dedicated commitment that South Dakota has always displayed to EROS. South Dakota has been good to us. During the past 15 years, the Sioux Falls Development Foundation, the city of Sioux Falls, and the State of South Dakota have given EROS the highest level of cooperation in every facet of activity.

The site selection will be made within a few weeks. Whatever the decision is, we can be proud that we did a bang-up job in showing EROS, its facilities and its staff, to the US WEST team. Thanks for your enthusiastic cooperation.

Allen H. Watkins

COMPUTERS — MANAGING DATA CENTER ACTIVITIES

by Mary Jungling

Computer operations equipment at the EROS Data Center includes a variety of computers that handle many of the Data Center's activities. Thirteen major computers have specific tasks and a variety of peripheral equipment assists with these operations. In addition, numerous smaller computers — micros and pc's — function as workstations for various tasks.

All of the major computers are located in the computer room. Included in this group are the Burroughs B6900, Gould PN6006, SEL 32/77, SEL 32/55, SEL 32/87, DEC VAX 8200, DEC PDP 11/70, Gould PN9050, HP3000, DEC PDP 11/60, DEC VAX 11/780 (VAX A), DEC VAX 11/780 (VAX B), and the Intergraph 11/23.

Local and Remote Terminals

With local and remote terminals, the Burroughs (B6900) provides for Inquiry, Ordering and Accounting functions through the INORAC software. The PN6006 is the major component of a system that is scheduled to replace the Burroughs system. It will be the central node in a system that will utilize five or six Altos computers at EDC and eight Altos at other mapping centers to perform inventorying, order process, product processing, and accounting activities for distribution of products. In conjunction with these activities, the software staff also conducts Distributed Ordering, Research, Reporting, and Accounting Network (DORRAN) software development on the PN6006.

Digital Image Processing System

The EROS Digital Image Processing System (EDIPS) software operates in association with two SEL 32/77 computers. The main functions of these two computers center around Landsat data processing, copying, and enhancing of images. The SEL 32/55 computer provides tape copy functions. It also verifies incoming computer compatible tapes (X-CCTs) and Thematic Mapper data received from Goddard and EDIPS products.

Data management personnel utilize the SEL 32/87 primarily for production of digital line graph (DLG) data. Although the main usage is in this area now, the Scientific software staff initially used the

32/87 for software development. In the near future, the Data Center will upgrade this system to a 32/97 to be compatible with the rest of the Division.

AVHRR Data Acquisition and Processing

One of the most recently acquired computers at the Data Center is the VAX 8200 which receives and archives AVHRR data from meteorological satellites and then generates geo-registered products from these data. The AVHRR Data Acquisition and Processing System software associated with the 8200 provides for acquisition of data from the satellites and for various aspects of processing that assist in: (1) archiving for temporary storage, (2) assessing the imagery for permanent archive, (3) generating facsimile print for cloud cover assessment, and (4) providing enhancements in response to customers' requests.

The Business software staff uses the DEC 11/70 computer mainly for development and maintenance purposes associated with the Maps, Photographs, and Publications System (MAPPS) software that is utilized by the Rocky Mountain Mapping Center. MAPPS is a software package for the inventorying, ordering, and accounting of the Division's published maps. The PN9050 system is used for a variety of tasks. The primary function is image processing; this includes digital data production, image mapping of raster data, and custom image processing. Other functions include software development activities and routing printing commands through the system. The HP3000 is a computer used primarily by applications scientists in image processing. The IDIMS software runs on this system and was instrumental in production of the Chernobyl image that received nationwide attention last year. Additional image processing facilities include the DEC PDP 11/60 and VAX A. The 11/60 functions primarily in the area of geometric registration for distortion removal; VAX A works

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Reporters: Mary Jungling
Gray Tappan

Production: Jan Nelson
Darla Larsen



From left, Gray Tappan and Steve Howard, EDC, and Babcar Diouf from Tambacounda, stand near a giant termite mound in southeastern Senegal. This area was covered with lush, green vegetation during the EDC scientists stay.



Mrs. Suliman Diallo, far right, entertains friends in her home in Dakar, Senegal. Gray Tappan, who became a friend of Mrs. Diallo's husband when he was previously in Africa, and Steve Howard, visit with neighbors who stopped by for the afternoon meal in the Diallo home. Steve said that the people in that area always prepare much extra food because it is the custom for friends to drop in at meal time.

EROS Staff Travel to Africa

by Gray Tappan

The summer rains returned to the Sahel of West Africa in 1985, 1986, and 1987 following the record-breaking droughts of the previous two years. The same rains, so needed for crops, also have brought increased breeding of locusts and grasshoppers, a Catch-22 situation which threatens the region's ability to produce food. The grasshopper infestations last year in Senegal were one of the most serious in West Africa. The U.S. Agency for International Development (USAID) mounted major spraying operations over some of the critical areas, protecting some of the cropland from further damage and averting a potential food shortage.

Early this year, USAID planned for another major grasshopper campaign in West Africa, particularly since the grasshoppers were able to lay eggs before spraying took place last year. The EROS Data Center has an important role in this campaign through the recently initiated demonstration project sponsored by the Office of Emergency Operations, USAID. The purpose is to develop, pilot test, and evaluate a near-real-time monitoring procedure using remote sensing and information system technologies for use in grasshopper control programs in three West African countries: Senegal, The Gambia, and Mauritania. One of the main tasks of the EROS Data Center has been to

produce maps of vegetation greenness using NOAA-AVHRR data for the three countries. The maps have been coming out every two weeks since April. They show the greening of vegetation in response to the start of West Africa's rainy season, allowing the U.S. and African grasshopper control teams to monitor vegetation development throughout the season. Areas of green-up of herbaceous cover can be favorable for the hatching and development of grasshoppers, and are thus key areas to survey for possible infestations.

In order to help integrate the map products into the operations of this year's campaign, Gray Tappan and Stephen Howard of the EROS Bioscience Applications Section, traveled to Senegal, The Gambia, and Mauritania in June and July. They introduced the map products to USAID staff and to host government officials. The maps have generated considerable interest to date, and have been used to plan aerial surveys over possible infestation sites. Gray and Steve conducted workshops in the three respective capitals: Dakar, a modern city with an interesting blend of French architecture and African Culture; Banjul (formerly Bathurst), a poor, sleepy town which has seen better days, and Nouakchott, a dusty town swamped with refugees from Mauritania's bleak countryside. Traveling overland between capitals,

they encountered extreme contrasts in landscape and culture, from the sedentary rice cultivators of the Guinean forest zone in the south, to the nomadic camel herders along the Sahara's southern edge.

Don Moore and Tom Loveland have also been in Africa this year, working on AID-related activities.

COMPUTERS

(Continued from page 2)

with image processing in essentially the production mode.

Geographic Information Systems Development

Applications scientists in the Technique Development and Applications Branch use VAX B for geographic information systems development (in association with the ARC/INFO package) for such activities as the Agency for International Development (AID) project. Other project work by the TD&AB includes cartographic data standards, cartographic output, and surface generation. The Scientific software staff also conducts software development on VAX B.

The Intergraph 11/23, in conjunction with the IMODES system, is responsible for DLG digitizing; associated digitizing activities include software development efforts. Engineering services utilize the 11/23 to register the building floor plan and to assist with facilities management activities.

The Other Life

Ron Lietzow — Backpacking, A Retreat Into Wilderness

by Mary Jungling

Ron Lietzow, a Senior Scientist in the Technique Development and Applications Branch, enjoys the slow pace that backpacking offers him. He finds that it provides a retreat from everyday living and is a very relaxing experience. Ron considers himself an outdoors type and has been interested in camping and tenting for most of his adult life.



Ron Lietzow

He began his backpacking adventures about six years ago with a trip to the Banff National Park in Canada and just recently backpacked in the Clearwater Mountains in Idaho.

On a backpacking excursion, Ron takes the very minimum of equipment and necessities. He wears the standard hiking boots and two pairs of socks—a thin nylon pair which allow the skin to breathe and a wool pair for moisture absorption. His 40- to 50-pound pack includes a two-person (in reality one and a half-person) tent, a mummy sleeping bag, rain gear, a change of clothes, a cookstove that is approximately 4 inches high and 4 inches in diameter, eating utensils, two quarts of water, a food supply, and a small spade. His pack has a bell which is a precautionary measure; it serves as an alert to the wildlife, particularly bears, so that they will not be startled and consequently attack. His camera (with extra film), a small Bible, and a personal journal complete the equipment.

Ron uses a standard USGS topographic 7 1/2-minute quad map to set his course and then makes his way by matching features of the map to the terrain to guide him. Sometimes the maps indicate trails

that are not readily recognizable because of overgrowth. He does take a compass but uses it relatively little. Ron hikes about five to seven miles in and sets up a base camp. A typical backpack trip lasts five days—a day each for hiking in and out and three days at a base camp. Streams or small glacier-created lakes, tarns, provide the ideal campsites. The lakes are relatively small (2 to 40 acres) and frequently several are located within a mile or two of each other. From his base camp, Ron plans 6- to 10-mile daily hikes that enable him to return in the evening. Without the pack, the day hike is very rewarding. Because he can walk more quietly — lighter load and no bell — he sees more wildlife. It also is a great opportunity to take pictures. During his last trip, he came within 20 feet of a mountain goat.

Encounters with wildlife have contributed to the adventuresome nature of his experiences. He has awakened to the sounds of elk feeding so close to his tent that he could hear the grass ripping. The most unique encounter was with the infamous bear. He had heard a couple of cub bears run by his tent; it wasn't long before "mama" bear came on the scout for the cubs. She peered into his tent but went along her way when there was no scent of the cubs or of food. Ron says it was "no problem." Most of the areas in which he backpacks receive little hunting pressure; therefore, encounters with wildlife can be frequent. Some hikers carry firearms for protection but he prefers not to.

Ron's style of backpacking includes using freeze-dried food products for meals. Although some hikers like to outfit themselves with elaborate cooking and food supplies and like to fish, Ron prefers adding boiling water to a freeze-dried package and his meal is set. He obtains his water supply from lakes and streams and treats it with iodine for purification.

This is a brief view into the adventures of one backpacker. Ron noted that the book "The Complete Walker" by Colin Fletcher provides a good background on backpacking and recommends it for anyone interested in this rewarding avocation.

Congressmen Visit EDC

South Dakota's Congressman Tim Johnson and the Sioux Valley Empire Electric Association hosted a visit of Congressman Paul Henry of Michigan to the EROS Data Center on August 10, as a part of the "Bringing Congress to the Country" program to expose urban representatives to rural communities. Congressman Henry was particularly interested in EROS because he serves on the Science, Space, and Technology Committee and the Natural Resources Agriculture Research and Environment and Science Research, and Technology subcommittees.

About 60 Rural Electric Association patrons accompanied the Congressmen. Mr. Watkins explained the EROS mission and facilities to our distinguished visitors and conducted a tour for them. Wayne Miller briefed them on various types of data processed at EDC and focused on the use of satellite data to monitor flooded agricultural areas in South Dakota.

EROS Educational Outreach

Ron Beck coordinated a week-long course, "Looking Down at Our World: an Introduction to Remote Sensing," for the Sioux Falls College 1987 Elderhostel program. Thirty-nine participants from 18 states attended the morning classes. Sue Jensen and Don Ohlen also served as instructors and Karla Sprenger and Phyllis Wiepking hosted the group on a tour of EDC.

Three staffers conducted presentations for area colleges' Aerospace Workshops for Educators. Ron Lietzow spoke to attendees at Southwest Minnesota State University at Marshall; John Faundeen tutored participants at Wayne State College, Wayne, Nebraska; Eric Holm gave a briefing and demonstration to Augustana College attendees.

Educational Opportunities

Local and area colleges and universities provide us current informational materials on courses offered each semester. Watch the bulletin boards for flyers and announcements. Also, college catalogs and flyers are placed in the Administrative Office for EDC employees' use.

EROS PEOPLE

Awards

Doug Binnie, Data Production and Distribution Branch (DP&DB), received a special achievement award for sustained excellent performance in the carrying out of the duties of his office.

Norman Bliss, Technique Development and Applications Branch (TD&AB), was presented a special achievement award for superior performance in his activities as project leader on the STATSGO project, a cooperative program with the Soil Conservation Service.

John Boyd, Computer Services Branch (CSB), was honored for his outstanding efforts as technical project manager for the establishment of the Advanced Very High Resolution Radiometer receiving and processing system.

Mary Lou East, Office of the Chief, received an award for special achievement and sustained excellent performance.

Steve Faith, Data Production and Distribution Branch (DP&DB), received special recognition for his efforts in contributing to efficiency and economy related to equipment problems and failures at EDC. His ingenuity resulted in large savings, particularly to the Diazo equipment.

Tom Holm, DP&DB, received special achievement recognition for sustained excellent performance.

Steve Howard and **Tom Loveland**, TD&AB, were honored for superior performance in the development of the International Activities Program, a cooperative program to support development activities in foreign countries being sponsored by the U.S. Agency for International Development.

Jan Howe, DP&DB, received special recognition for her superior contribution to the planning and organization of registration and payment of fees for the Eleventh Pecora Memorial Symposium.

Arlis Johnson, Administrative Office, received a special achievement award for consistently performing her duties in an outstanding and professional manner.

Doris Johnson, CSB, and **Phyllis Spanton**, DP&DB, were honored for special achievement for filling in

Landis Receives High Award

Glenn H. Landis, Deputy Chief of the EROS Data Center, was recently awarded one of the U.S. Department of the Interior's highest awards, the Meritorious Service Award.

The citation, signed by secretary of the Interior Donald Paul Hodel reads as follows.

Citation for Meritorious Service

In recognition of his foresight, dedication and outstanding contributions to the success of the remote sensing missions of the Geological Survey.

half-time for a staff member who was on sick leave while continuing to do all of their regular duties in an exemplary fashion.

Rich Lee, Computer Services Branch (CSB), was awarded a special achievement citation for his efforts instrumental to microcomputer support and training, his leadership of software projects, and his representation of EDC's interests at National Mapping Division's Management Information System discussions.

Jeffery McBrayer and **Jennifer Stansbery**, CSB, received special achievement awards for sustained excellent performance in their contributions to the programming activities of the Branch.

Wayne Miller, TD&AB, earned a special achievement award for his excellent performance on the development of the AVHRR reception and processing system and his work in the development of the AVHRR mosaic of the western U.S.

Mike Neiers, CSB, received an award for excellent overall performance, especially his participation in the successful development of networking software and specifically the implementation of the network printing capability at EDC.

Lyn Oleson, CSB, was honored for special achievement in sustained excellent performance of his duties.

Carol Van Winkle, Administrative Office, received a special achievement award for sustained outstanding performance.

Dwayne Wipf, DP&DB, was awarded a special recognition award for continued excellent performance, loyalty, and dedication to EDC in the performance of his duties in Data Management Section.

Since joining the Geological Survey in 1970, Mr. Landis has been instrumental in the development of the data archives, storage and retrieval system of the EROS Data Center. He directed the production and distribution activities into an operational model of efficiency and response. He applied his unique talents and energy to devise innovative and improved approaches for storage and retrieval of over 7.8 million frames of satellite- and aircraft-acquired imagery and a high quality production activity. This accomplishment has enabled the Center to be noted for its customer satisfaction and timely responsiveness. His perception of how best to apply automated data processing procedures and state-of-the-art technology has resulted in significant improvements and cost effectiveness in these activities.

Mr. Landis was instrumental in pre-construction planning for the design of the facilities of the EROS Data Center. His expert planning resulted in a facility that is energy efficient, easy to maintain and one which has required minimal alterations over the past 12 years to adapt to a changing mission and workload. He is an advisor to other Government agencies, private industry and academia on the broad range of acquisition, handling, processing, distribution, researching and applications of aircraft and spacecraft acquired data and geographic information systems. His advice and counsel has contributed significantly to the success of the operation of the EROS Data Center which is an international leader in the development of remote sensing data applications and geographic information systems. For his outstanding leadership, exceptional achievements and valuable contributions, Glenn H. Landis is granted the Meritorious Service Award of the Department of the Interior.

McManus Coaches Champs

Lee McManus, Chief of the Technical Information Section, is recognized by EDC associates for his fine artistic talents. A lesser known talent is his coaching ability. Lee coached his son Erin's soccer team — the 1987 Bantam Boys Advanced League *State Champions* and the 1987 Coca-Cola Invitational Tournament Champs.

EDCEA Activities

The EDCEA Cookbook has been finalized and sent out for printing. Three hundred cookbooks have been ordered; they should arrive in October. The price will be \$6.00 for the first two with each additional book purchased at the same time \$5.00. Begin thinking about EDCEA cookbooks for Christmas presents and order them as soon as they're available. Lots of new T-shirts have been ordered and will make great Christmas gifts also.

And, speaking of Christmas—it's really just around the corner! Plans for the Christmas party are already well under way. In keeping with the wishes of the majority of EDC employees, as expressed in last spring's questionnaire, we'll have a 50's Party theme. Dress will be casual and music of the 50's will be played by Mogen's Heroes. The party will again be held at the Holiday Inn-City Centre. Updates on the Christmas party will be forthcoming as the time draws nearer.

Several committee chairs are open. Why not volunteer to serve? It's a great way to get better acquainted with your fellow employees and to achieve a feeling of satisfaction. Your EDCEA officers and committee members work very hard to plan interesting activities for all of us. They deserve a word of thanks now and then from those of us who too often take them for granted.

EDC Arts Committee

Jan Nelson has agreed to serve as president of the EDC Arts Committee in the absence of *Jim Sturdevant*, who left last month for a year-long Departmental Manager Development Program.

The Arts Committee continues to enhance our work environment by scheduling showings of area artists in our Cafeteria Gallery. This ongoing effort takes a lot of time and energy of a few dedicated persons, who agree that it is a worthwhile endeavor. However, they could use some more enthusiastic, energetic art devotees on the committee. If you have any interest in working with the Arts Committee, please contact Jan Nelson in TIO Section — extension 6173.

Do you remember when . . .



Tour Guides wore mini skirts?



And Lab Techs wore bunny suits?

If you do, you qualify as an EDC old timer!

Federal Women's Program

The EDC Chapter of the Federal Women's Program sponsored an Adult Education Fair at the Center in July. All employees and adult members of their families were invited. Representatives from Augustana College, Dakota State College, National College, Sioux Falls College, South Dakota State University and the University of South Dakota participated. Each school staffed a table with informational materials about evening and weekend course offerings, credits for experiential learning, financial assistance, and other topics pertinent to the non-traditional student.

Promotion

Harold Christensen has been promoted to associate professor of computer science at Sioux Falls College. Harold spent a one-year sabbatical in Computer Services at EROS last year and returned this summer to work on special projects. A graduate of Sioux Falls College, he joined his alma mater's staff in 1978. He has a master's degree from the University of South Dakota.

The Director of the U.S. Geological Survey has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this agency.